

What is claimed is:

1. A method of manufacturing an optical element comprising the steps of:

5 forming a through hole in a semiconductor element which has an optical section and an electrode electrically connected to the optical section; and

forming a conductive layer extending from a first surface of the semiconductor element on which the optical section is  
10 formed, through an inner wall surface of the through hole, to a second surface opposite to the first surface.

2. The method of manufacturing an optical element as defined in claim 1,

15 wherein an external electrode which is electrically connected to the conductive layer is formed on the second surface of the semiconductor element.

3. The method of manufacturing an optical element as defined  
20 in claim 1,

wherein after forming a stress relieving layer on the second surface of the semiconductor element, the conductive layer is formed over the stress relieving layer.

25 4. The method of manufacturing an optical element as defined in claim 2,

wherein after forming a stress relieving layer on the

second surface of the semiconductor element, the conductive layer is formed over the stress relieving layer, and the external electrode is formed in a position on the second surface corresponding to the stress relieving layer.

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5. The method of manufacturing an optical element as defined in claim 1,

wherein the semiconductor element is a semiconductor chip cut from a semiconductor wafer.

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6. The method of manufacturing an optical element as defined in claim 1, wherein:

the semiconductor element is part of a semiconductor wafer;  
and

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the semiconductor wafer is cut into individual chips, each of the individual chips being the semiconductor element.

7. The method of manufacturing an optical element as defined in claim 1,

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wherein after forming the conductive layer, a light-transmitting member is provided on the first surface.

8. The method of manufacturing an optical element as defined in claim 5, wherein:

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after forming the conductive layer, a light-transmitting member is provided on the first surface; and

the light-transmitting member is of substantially the same

shape as the semiconductor chip.

9. The method of manufacturing an optical element as defined in claim 6, wherein:

5. after forming the conductive layer, a light-transmitting member is provided on the first surface; and

the light-transmitting member is of substantially the same shape as the semiconductor wafer.

10. The method of manufacturing an optical element as defined in claim 6, wherein:

after forming the conductive layer, a light-transmitting member is provided on the first surface;

15. the light-transmitting member is of substantially the same shape as the semiconductor element of the semiconductor wafer;

the electrical characteristics of the semiconductor element of the semiconductor wafer are tested to determine satisfactory portions; and

20. the light-transmitting member is provided on the semiconductor element determined to be satisfactory portions.

11. The method of manufacturing an optical element as defined in claim 10,

25. wherein the light-transmitting member is provided after the semiconductor wafer is cut.

12. The method of manufacturing an optical element as defined

in claim 7,

wherein the light-transmitting member is an optical glass.

13. The method of manufacturing an optical element as defined

5 in claim 1,

wherein a color filter is provided on the first surface.

14. The method of manufacturing an optical element as defined

in claim 1,

10 wherein after forming the conductive layer, microlenses  
are provided on the first surface.